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OH180 PROGRAMMABLE CONTROLLER SOFTWARE RELEASES

Report 87-29-K

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ABSTRACT

This report provides details of the OH180 Programmable Controller software released by the Electrical Research Department in the period from May 15, 1982 to September 30, 1986. Version numbers and release dates are provided for each software module.

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To

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OH180 PROGRAMMABLE CONTROLLER SOFTWARE RELEASES

J.D. Bruce

1. INTRODUCTION

This report documents the release history of the software that was developed for the OH180 Programmable Controller system. It forms part of the documentation for the Software Quality Assurance (SQA) Program for the OH180 as outlined in the OH180 SQA Manual/1/. Included are summaries of the contents of each software release, as well as cross-reference tables detailing the release history of each constituent software module. The modules covered are:

- OH180 Programmable Controller Executive (EXEC.BIN)
- OH180 Programming Station Executive System Software (PC.SAV) - includes main menu handler, ladder entry/edit, compiler, EPROM programmer driver and print driver
- OH180 Test Monitor (TM.SAV)
- OH180 Field Monitor (FM)
- OH180 Communication Module (CM)

The time period covered by this document is from May 15, 1982 (the first issue of a complete working set of software, which forms the baseline release) to September 30, 1986. Full documentation on software releases after September 30, 1986 are on file at the Research Division.

This report was originally circulated in draft form with the number E86-35-K.

This report is primarily concerned with software released by the Electrical Research Department. However, for reference purposes the report includes cross reference information showing the origin of software released by the Electrical Design Department to Darlington Engineering and Darlington Operations.

2. DESCRIPTION OF RELEASES

Table 1 lists, in order of release date, the contents of each software package released to Electrical Design by Electrical Research. Each module in each release is identified by its unique identifier: creation date in the case of PC.SAV and version number in the case of the other modules. In the case of EXEC.BIN and TM.SAV, Table 1 also shows the dates that appeared in the directories of the system disks on which they were issued. (These dates are included for reference purposes only and are not part of the identification.) The column at the right of Table 1 gives the date of the release notes for each release. The release notes, which are on file at the Research Division, document the features, sources, compatibilities and restrictions of each release. Where applicable, the release notes reference other documents concerning the background for the changes implemented, such as documents defining the previous release's problems, bugs or required improvements.

Table 1 indicates, by asterisks, which of the various releases of each module was ultimately included in a release issued to Darlington Engineering by Electrical Design. (For reference purposes, Tables 7 and 8 describe the contents of each of these Darlington releases.) All of the other releases from Electrical Research were versions which were never released to Darlington Engineering, either because they were preliminary or incomplete versions sent to Electrical Design for evaluation of certain features, or else because the testing by Electrical Design revealed certain limitations requiring further modifications.

In addition to the software versions released to Electrical Design, described by Table 1, there were a number of other intervening versions which were not released. These were versions which encountered problems in pre-release testing by Electrical Research (and rectified in subsequent versions) or else contained experimental test or other developmental features not required by the final software. These unreleased intervening versions account for the "missing" version numbers in Table 1 such as, for example, version PCX110 of EXEC.BIN. In all cases the release note documentation covers all changes since the previous release, not just changes since the previous version.

Tables 2 to 6 summarize the version history of each software product. Included are the date that the software was released to Electrical Design by Electrical Research and (if applicable) the date that the software was transferred to Darlington Engineering.

As in Table 1, only the versions that were released outside the Research Division are shown.

In addition to the foregoing, Table 5 also shows the dates the Communications Module software was released to Tele-Radio Systems. These dates are the earliest that particular versions of the software could be used in production Communication Modules.

For cross-reference purposes Table 7 lists the contents of each software package released to Darlington Engineering and Darlington Operations by the Electrical Design Department. Each module in the software package is identified, and the original Research release date is given to permit cross reference to Table 1. The major distinguishing features of each Darlington software release are described in Table 8. The Appendix contains the definitions of the terms and abbreviations used in the tables.

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REFERENCES

1. Software Quality Assurance (SQA) Manual for Ontario Hydro's OH180 Programmable Controller: Darlington GS; Electrical Design Department, November 27, 1986.

APPENDIX

DEFINITIONS OF TERMS AND ABBREVIATIONS

CM	OH180 Communications Module
DO	Darlington Operations
DE	Darlington Engineering Department
ED	Electrical Design Department
ER	Electrical Research Department
EXEC.BIN	Name of the file containing the OH180 Executive on OH180 Programming Station system disks
FM	OH180 Field Monitor (= Field/Test Monitor compiled to run on the VT103 Field Monitor hardware)
PC.SAV	Name of the OH180 system disk file containing the Programming Station system software (menu handler, ladder entry/edit handler, compiler, print routines)
TM	OH180 Test Monitor (= Field/Test Monitor compiled to run on the Programming Station)
TM.SAV	Name of the OH180 system disk file containing the OH180 Test Monitor program.
TRS	Tele-Radio Systems Ltd.

TABLE 1

SOFTWARE RELEASED TO ELECTRICAL DESIGN BY ELECTRICAL RESEARCH

	Software Identification				
Release Date	PC.SAV	EXEC.BIN (Note 1)	TM.SAV (Note 1)	Other (Note 2)	Date of Release Notes
May 15/82	May 14/82	PCXV10(May 14/82)	TMX2.2(May 14/82)		May 17/82
Jun 30/82	Jun 30/82	PCXV11(Jun 16/82)	TMX3.0(Jun 30/82)		Jul 7/82
Jul 22/82	Jul 22/82	PCXV11(Jun 16/82)	TMX3.0(Jun 30/82)		Jul 23/82
Jul 30/82	Jul 28/82	PCXV11(Jun 16/82)	TMX3.1(Jul 29/82)		Jul 30/82
Aug 18/82		PCXV99 (Note 3)			Aug 18/82
Oct 25/82			TM3.2	FM1.1	Oct 25/82
Nov 2/82		PCXV98(Aug 18/82)*			Nov 2/82
Mar 23/83			TM3.3(Mar 23/82)		Mar 30/83
Mar 23/82		PCXV13			Apr 8/83
Mar 28/83				FM1.2(3.3)	Mar 30/83
Apr 14/83		PCXV14			Apr 11/83
Apr 20/83		PCXV15(Apr 20/83)*			Apr 21/83
Jun 16/83				FM1.3(3.4)	Jun 15/83
Jun 17/83				OH180 Test Software (Note 4)	Jun 17/83
Jul 7/83			TM3.4(Jul 7/83)*		Jul 7/83
Jun 30/84	Jun 30/84	PCXV15(Apr 20/83)			Jun 30/84
Sep 18/84	Sep 19/84	PCXV16(Sep 20/84)			Sep 20/84
Oct 16/84	Oct 16/84	PCXV16(Sep 20/84)			Oct 18/84
Jan 31/85	Jan 29/85	PCX100(Jan 29/85)		PCCOM11	Jan 31/85
Feb 18/85	(Note 5)	PCX101(Feb 11/85)		COMXV2 Rev 1.2	Feb 18/85
Mar 11/85	Mar 11/85	PCX101(Feb 11/85)			Mar 11/85
Apr 15/85	Apr 15/85	PCX101(Feb 11/85)			Apr 16/85
Apr 29/85	Apr 29/85	PCX101(Feb 11/85)			Apr 29/85
Apr 30/85				COMXV8 Rev 1.1	Apr 29/85
May 2/85	Apr 31/85	PCX101(Feb 11/85)			May 2/85
May 3/85	May 2/85	PCX102(May 2/85)			May 7/85
May 23/85	May 2/85	PCX103(May 14/85)	TM3.5(May 16/85)		May 24/85
May 27/85	May 2/85	PCX104(May 24/85)	TM3.5(May 16/85)		May 27/85
May 27/85				COMXV9 Rev 1.0	May 27/85
Jun 17/85	Jun 17/85	PCX105(Jun 14/85)	TM3.7(Jun 14/85)		Jun 17/85
Jun 24/85				FM1.4(3.7)	Jun 24/85
Jun 26/85	Jun 25/85	PCX105(Jun 14/85)	TM3.8(Jun 26/85)		Jun 26/85
Jun 28/85	Jun 27/85*	PCX105(Jun 14/85)	TM3.8(Jun 26/85)		Jun 28/85
Jul 23/85	Jul 15/85	PCX105(Jun 14/85)	TM3.9(Jul 18/85)		Jul 23/85
Jul 26/85				FM1.5(3.9)	Jul 26/85
Oct 10/85	Jul 15/85	PCX106(Oct 10/85)*	TM3.9A(Oct 10/85)*		Oct 10/85
Oct 11/85	Oct 11/85*	PCX106(Oct 10/85)	TM3.9A(Oct 10/85)		Oct 11/85
Oct 16/85				COMXV9 Rev 1.6	Note 6
Oct 29/85	Oct 11/85	PCX107(Oct 29/85)*	TM3.9A(Oct 10/85)		Oct 29/85
Nov 6/85	Nov 6/85*	PCX108(Nov 6/85)*	TM3.11(Nov 6/85)*		Nov 11/85
Nov 12/85				COMXV9 Rev 2.0	Nov 12/85
Nov 13/85				COMXV9 Rev 2.1	Nov 13/85
Nov 14/85				FM1.6(3.11A)	Nov 14/85
Nov 14/85	Nov 6/85	PCX108(Nov 6/85)	TM3.11A(Nov 12/85)*		Nov 14/85
Nov 26/85				COMXV9 Rev 2.2	Nov 26/85

Dec 11/85				COMXV9 Rev 2.4	Dec 11/85
Dec 12/85	Dec 12/85*	PCX108(Nov 6/85)	TM3.11A(Nov 12/85)		Dec 12/85
Jan 16/86	Jan 15/86	PCX108(Nov 6/85)	TM3.11A(Nov 12/85)		Jan 16/86
Jan 28/86	Jan 27/86	PCX108(Nov 6/85)	TM3.12(Jan 29/86)		Jan 28/86
Feb 28/86	Feb 28/86*	PCX109(Feb 27/86)*	TM3.14(Feb 25/86)	FM1.7(3.14)	Feb 28/86
Mar 7/86	Feb 28/86	PCX109(Feb 27/86)	TM3.15(Mar 7/86)	FM1.7(3.15)	Mar 7/86
Mar 13/86	Mar 12/86*	PCX109(Feb 27/86)	TM3.15A(Mar 13/86)	FM1.7(3.15A)	Mar 13/86
Jun 3/86	Jun 3/86* (Note 7)	PCX109(Feb 27/86)	TM3.16(May 28/86)*		Jun 3/86
Jun 10/86				FM1.8(3.16)	Jun 10/86
Jun 10/86	Jun 3/86	PCX111(Jun 6/86)*	TM3.16(May 28/86)	COMXV10 Rev 1.1	Jun 10/86
Sep 8/86		PCX111 Source (Note 8)		COMXV10 Rev 1.1 Source (Note 8)	Sep 8/86

*Software module included in a subsequent release to Darlington (see Table 7).

Note 1: Date shown in brackets is the date appearing in the directory of the system disk on which the software module was issued.

Note 2: FM = Field Monitor PCCOM = Early version of COMX COMX = CM Executive V = "version"

Note 3: Interim test version of EXEC.BIN not released on a system disk.

Note 4: Includes PCSUT, SYST1, SYSTEX and FUNC. See also memo Griffin to Veevo September 17, 1985.

Note 5: Date (Feb 13/85) was omitted from directory.

Note 6: Unofficial version released without release notes, for preliminary evaluation.

Note 7: Source files for this version were released separately on June 19, 1986; release notes dated June 19, 1986.

Note 8: Source files sent to ED for archival purposes only (HP64000 format).

Table 2
OH180 Version History - PC.SAV

Version ID	Release Date (ER to ED) (Note 1)	Release to Darlington (ED to DE or DO) (Note 2)
May 14/82	May 15/82	
June 30/82	June 30/82	
July 22/82	July 22/82	
July 28/82	July 30/82	
June 30/84	June 30/84	
Sep 19/84	Sep 18/84	
Oct 16/84	Oct 16/84	
Jan 29/85	Jan 31/85	
Feb 13/85	Feb 18/85	
Mar 11/85	Mar 11/85	
Apr 15/85	Apr 15/85	
Apr 29/85	Apr 29/85	
Apr 31/85	May 2/85	
May 2/85	May 3/85	
June 17/85	June 17/85	
June 25/85	June 26/85	
June 27/85	June 28/85	V3 - Jun 28/85(DE)
July 15/85	July 23/85	
Oct 11/85	Oct 11/85	V4 - Oct 23/85(DE)
Nov 6/85	Nov 6/86	V5 - Nov 7/85(DE)
Dec 12/85	Dec 12/85	V6 - Dec 19/85(DE)
Jan 15/86	Jan 16/86	
Jan 27/86	Jan 28/86	
Feb 28/86	Feb 28/86	V7 - Mar 11/86(DE)
Mar 12/86	Mar 13/86	V7 - May 11/86(DO)
June 3/86	June 3/86	V8 - Jun 11/86(DE)

Note 1: See Table 1 for documentation cross reference.
Note 2: See Table 7 for documentation cross reference.

Table 3

OH180 Version History - EXEC.BIN

Version ID	Release Date (ER to ED) (Note 1)	Release to Darlington (ED to DE or DO) (Note 2)
PCXV10	May 15/82	
PCXV11	June 16/82	
PCXV99	Aug 18/82	
PCXV98	Nov 2/82	V1 - Mar 25/83 (DE)
PCXV13	Mar 23/83	
PCXV14	Apr 14/83	
PCXV15	Apr 20/83	V2 - Aug 4/83 (DE)
		V3 - Jun 28/85 (DE)
PCXV16	Sept 18/84	
PCX100 (Note 3)	Jan 31/85	
PCX101	Feb 18/85	
PCX102	May 3/85	
PCX103	May 23/85	
PCX104	May 27/85	
PCX105	June 17/85	
PCX106	Oct 10/85	V4 - Oct 23/85 (DE)
PCX107	Oct 29/85	V5 - Nov 7/85 (DE)
PCX108	Nov 6/85	V6 - Dec 19/85 (DE)
PCX109	Feb 28/86	V7 - Mar 11/86 (DE)
		V7 - May 11/86 (DO)
PCX111	June 10/86	V8 - Jun 11/86 (DE)

Note 1: See Table 1 for documentation cross reference.
2: See Table 7 for documentation cross reference.
3: Executive versions numbered 100 or higher support the OH180 CM.

Table 4

OH180 Version History - TM

Version ID	Release Date (ER to ED) (Note 1)	Release to Darlington (ED to DE or DO) (Note 2)
TMX2.2	May 15/82	
TMX3.0	Jun 30/82	
TM3.1	Jul 30/82	
TM3.2	Oct 25/82	
TM3.3	Mar 23/83	V1 - Mar 25/83 (DE)
TM3.4	Jul 7/83	V2 - Aug 4/83 (DE)
TM3.5	May 23/83	
TM3.7	Jun 17/85	
TM3.8	Jun 26/85	V3 - Jun 28/85 (DE)
TM3.9	Jul 23/85	
TM3.9A	Oct 10/85	V4 - Oct 23/85 (DE)
TM3.11	Nov 6/85	V5 - Nov 7/85 (DE)
TM3.11A	Nov 14/85	V6 - Dec 19/85 (DE)
TM3.12	Jan 28/86	
TM3.14	Feb 28/86	
TM3.15	Mar 7/86	V7 - Mar 11/86 (DE)
TM3.15A	Mar 13/86	V7 - May 11/86 (DO)
TM3.16	Jun 3/86	V8 - Jun 11/86 (DE)

Note 1: See Table 1 for documentation cross reference.
Note 2: See Table 7 for documentation cross reference.

Table 5

OH180 Version History - CM

Version ID (Note 1)	Release Date (ER to ED) (Note 2)	Release Date (to TRS) (Note 3)
PCCOM11	Jan 31/85	
COMXV2 Rev1.2	Feb 18/85	
COMXV8 Rev1.1	Apr 30/85	
COMXV9 Rev1.0	May 27/85	
COMXV9 Rev1.6	Oct 16/85	
COMXV9 Rev2.0	Nov 12/85	
COMXV9 Rev2.1	Nov 13/85	
COMXV9 Rev2.2	Nov 26/85	
COMXV9 Rev2.4	Dec 11/85	Jan 24/86
COMXV10 Rev1.1	June 10/86	Aug 5/86

Note 1: Only the versions released outside the Research Division are shown.
Note 2: See Table 1 for documentation cross reference.
Note 3: See Table 7 for documentation cross reference.

Table 6

OH180 Version History - FM
(For Release Documentation see Table 1

Version ID	Release Date (ER to ED)	Major Characteristics
FM1.1	Oct 25/82	First working FM released
FM1.2(3.3)	Mar 28/83	Modified to handle new 22 character system ID
FM1.3(3.4)	June 16/83	
FM1.4(3.7)	June 24/85	First FM to handle ladders with communication points
FM1.5(3.9)	July 26/85	
FM1.6(3.11A)	Nov 14/85	
FM1.7(3.14)	Feb 28/86	First FM to support a printer
FM1.7(3.15)	Mar 7/86	
FM1.7(3.15A)	Mar 13/86	
FM1.8(3.16)	June 10/86	

TABLE 7

ORIGIN OF SOFTWARE RELEASED TO DARLINGTON ENGINEERING AND DARLINGTON OPERATIONS BY ELECTRICAL DESIGN

Darlington Release	PC.SAV (Programming Station System Software)	EXEC.BIN (OH180 PC Executive)	TM.SAV (Field/Test Monitor Compiled for Prog. Station (Note 2)	Origin ER Release Date (Note 3)	Date of Release Notes
V1 (Mar 25/83)	Mar 23/82 (Note 1)	PCXV98(Aug 18/82)	TM3.3(Mar 23/83)	Nov 2/82(EXEC) Mar 23/83(TM)	Nov 2/82 Mar 30/83
V2 (Aug 4/83)	Jul 4/83 (Note 1)	PCXV15(Apr 20/83)	TM3.4(Jul 11/83)	Apr 20/83(EXEC) Jul 7/83(TM)	Apr 21/83 Jul 7/83
V3 (Jun 28/85)	Jun 27/85	PCXV15(Apr 20/85)	TM3.8(Jun 26/85)	Apr 20/83(EXEC) Jun 26/85(TM) Jun 28/85(PC)	Apr 21/83 Jun 26/85 Jun 28/85
V4 (Oct 23/85)	Oct 11/85	PCX106(Oct 10/85)	TM3.9A(Oct 10/85)	Oct 10/85(EXEC,TM) Oct 11/85(PC)	Oct 10/85 Oct 11/85
V5 (Nov 7/85)	Nov 6/85	PCX107(Oct 29/85)	TM3.11(Nov 6/85)	Oct 29/85(EXEC) Nov 6/85(PC,TM)	Nov 11/85 Nov 11/85
V6 (Dec 19/85)	Dec 12/85	PCX108(Nov 6/85)	TM3.11A(Nov 12/85)	Nov 6/85(EXEC) Nov 14/85(TM) Dec 12/85(PC)	Nov 11/85 Dec 12/85 Dec 12/85
V7 (Mar 11/86) (Darlington Eng)	Feb 28/86	PCX109(Feb 27/86)	TM3.15(Mar 7/86)	Feb 28/86(EXEC) Mar 7/86(PC,TM)	Feb 28/86 Mar 7/86
V7 (May 11/86) (Operations)	Mar 12/86 (Note 4)	PCX109(Feb 27/86)	TM3.15A(Mar 13/86)	Feb 28/86(EXEC) Mar 13/86(PC,TM)	Feb 28/86 Mar 13/86
V8 (Jun 11/86)	Jun 3/86	PCX111(Jun 6/86)	TM3.16(May 28/86)	Jun 3/86(PC,TM) Jun 10/86(EXEC)	Jun 3/86 Jun 10/86 Jun 19/86

Notes:

1. These versions of PC.SAV were created by Electrical Design.
2. For release of Field/Test Monitor firmware compiled for VT103 (Field Monitor) see Table 6.
3. These dates are given for cross-reference purposes. These are the dates which appear in the left hand column of Table 1.
4. This version of PC.SAV was modified by Electrical Design to prevent the creation of "issued" files.

Table 8

Darlington Releases - New Features

Release	Major Distinguishing Characteristics
V1 - Mar 25/83	First system released to Darlington
V2 - Aug 4/83	Additional fault flags; Improved executive error handling
V3 - June 28/85	Allowed entry of communications ladder diagrams (but not compiling or execution)
V4 - Oct 23/85	Full communications support (enter, compile and execute)
V5 - Nov 7/85	Fixed minor deficiencies in labelling of communications points
V6 - Dec 19/85	Minor improvements in ladder entry software
V7 - Mar 11/86 (Darlington Eng)	Executive modified to handle ground fault location correctly
V7 - May 11/86 (Operations)	Same as V7 - Mar 11/86 except modified to prevent the creation of "issued" ladder diagram files
V8 - June 11/86	Executive modified to flash 'ALL OK' LED if the EPROM's ladder diagram is based on a "work" file instead of an "issued" file